

RECEIVED
CENTRAL FAX CENTER

MAR 21 2007

Customer No. 01933

Application No. 09/851,874
Reply to Telephone InterviewListing of Claims:

1. (Amended) An information reproducing system comprising:
code reading means for reading a [desired] dot code from an information recording medium on which multimedia information including at least any one of audio information, image 5 information and digital code data has been recorded in the form of a dot code which can optically be read, to provide an image signal corresponding to an image formed from said dot code that has been read;
binarizing means for generating binarized data from [an] 10 said image signal [corresponding to the dot code read by said code reading means]; and
information reproducing means for restoring said binarized data generated by said binarizing means to [original] the multimedia information [to reproduce] and for reproducing the 15 multimedia information, wherein
said binarizing means includes:
reference dot detection means [which binarizes the image signal with a predetermined threshold value prior to generating binarized data so as to detect] for detecting a reference dot 20 from [the] said binarized [code image] data by use of a predetermined threshold value;
dot area measuring means for measuring [the] an area of the reference dot detected by said reference dot detection means; and threshold value modifying means for [modifying the]

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

25 obtaining a modified threshold value derived in such a manner that the area measured by said dot area measuring means approaches a predetermined target value[;and].

30 [threshold value determining means for binarizing the image signal with the threshold value modified by said threshold value modifying means.]

wherein said binarizing means generates said binarized data from said image signal based on said modified threshold value.

2. (Amended) An information reproducing system according to claim 1, wherein said binarizing means binarizes the image signal formed from said dot code that has been read by said code reading means in [one of field and frame] units of one field or units of one frame.

3. (Amended) An information reproducing system according to claim 1, wherein

 said code reading means successively reads [the code image] said dot code, and

5 said binarizing means [modifies the threshold value of the successive image signals read by said reading means in one of the previous field and previous frame in accordance with the area of the detected reference dot so as to binarize the one of the present field and present frame with] detects, with said

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

10 reference dot detection means, the reference dot from binarized
data generated from a particular image signal corresponding to an
image formed from said dot code of an immediately preceding field
or frame, said particular image signal having been binarized
based on said predetermined threshold value, and wherein said
15 binarizing means further measures the area of said reference dot
to obtain an area measurement, modifies the predetermined
threshold value, with said threshold value modifying means, based
on said area measurement, to derive said modified threshold
value, and binarizes a current field or frame based on the
20 modified threshold value.

4. (Original)

5. (Amended) An information reproducing system according
to claim 1, wherein the dot code recorded on said information
recording medium includes a data code corresponding to the
multimedia information and a pattern code for determining the
5 position at which the data code is read, and
the reference dot is at least a portion of the pattern code.

6. (Original)

7. (Amended) An information reproducing system according

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

to claim 1, wherein

 said reference dot detection means detects a plurality of
 said reference dots; and

5 said dot area measuring means has average area calculating
 means for calculating [the] an average area from areas of the
 detected [plural] plurality of said reference dots.

8. (Amended) An information reproducing system according
to claim 7, wherein

 said dot area measuring means has dot selection means for
 inhibiting input of the area of the reference dot into said
5 average area calculating means in a case where the measured area
 of each reference dot is [larger than] outside of a predetermined
 range.

9. (Amended) An information reproducing system according
to claim 1, wherein

 said threshold value modifying means has threshold value
 holding means for (i) counting the number of reference dots
5 detected by said reference dot detection means, [determines] (ii)
 determining whether or not the counted number of the reference
 dots satisfies a predetermined number and [inhibits] (iii)
 inhibiting modification of the threshold value in a case where

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

the counted number of reference dots is less than the
10 predetermined number.

10. (Amended) An information reproducing system according
to claim 1, wherein

said threshold value modifying means includes;
peak value detection means for detecting [the] a maximum
5 value and [the] a minimum value of [the] a luminance from a
[predetermined] detection region defined on the image formed from
the dot code read by said code reading means;

10 interior division ratio modifying means for modifying [the]
an interior division ratio in accordance with [the] an amount of
modification of the interior division ratio calculated from [the]
a difference between the area measured by said dot area measuring
means and the predetermined target value; and

15 threshold value calculating means [which divides the value]
for multiplying a difference between the maximum and minimum
values detected by said peak value detection means with the
interior division ratio modified by said interior division ratio
modifying means and adding the minimum value so as to [calculate
the] obtain said modified threshold value.

11. (Amended) An information reproducing system according
to claim 10, wherein said peak value detection means [interrupts

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

following processes for] terminates subsequent processing of the image signal for a [subject] current frame in one of a case where 5 the detected minimum value is larger than a predetermined first threshold value and a case where the detected maximum value is smaller than a predetermined second threshold value.

12. (Amended) An information reproducing system according to claim 10, wherein said peak value detection means has selective average calculating means for calculating [the] an absolute value of [the] a difference between luminance values 5 of pixels that are positioned adjacent to a pixel of interest and for calculating [the] an average value of the luminance values of adjacent pixels only when [a result of the calculation] said absolute value is smaller than a predetermined threshold value [so that], wherein said peak value detection means thereby 10 detects the peak values [are detected] from the calculated average value of the [calculated] luminance values.

13. (Amended) An information reproducing system according to claim 10, wherein said interior division ratio modifying means has an interior division ratio modification amount table for determining [the] an amount of modification of the interior 5 division ratio in accordance with [the] a relationship between dot area S and target value S_t [so as to determine] and

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

determines an amount Δk of modification of the interior division ratio from the measured dot area and the predetermined target value in accordance with said interior division ratio

10 modification amount table.

14. (Original)

15. (Original)

16. (Amended) An information reproducing system according to claim 10, wherein said interior division ratio modifying means changes the interior division ratio in a stepped manner and [provides] allows an interior division ratio modifying operation to have a hysteresis characteristic.

17. (Original)

18. (Original)

19. (Amended) An information reproducing system according to claim 10, wherein

5 said code reading means successively reads [the code images] said dot code,

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

10 said interior division ratio modifying means modifies the interior division ratio to one of a field and a frame which satisfies a predetermined condition for the successive image signals formed from said dot code read by said code reading means and holds the modified interior division ratio for one of the following field and frame.

20. (Amended) An information reproducing system according to claim 1, wherein

5 the dot code recorded on said information recording medium has an attitude dot disposed in a predetermined [region] area adjacent to [the] a reading start end and including information about said information recording medium for determining the threshold value required by said binarizing means, and

 said binarizing means includes:

10 attitude dot detection means for detecting the attitude dot; attitude reading means [which binarizes the image signals read by said reading means in one of field and frame units so as to read] for reading information relating said information recording medium from the attitude dot [of said binarized image] detected by said attitude dot detection means in the image signal formed from the dot code read by said code reading means and binarized based on the threshold value determined in accordance with said attitude dot; and

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

attitude storage means for storing information read by said
attitude reading means and applying information to each of
20 following images.

21. (Canceled)

22. (Canceled)

23. (Amended) An information recording medium [according to
claim 21,] for use in an information reproducing system having
code reading means for reading a dot code from an information
recording medium on which multimedia information including at
5 least any one of audio information, image information and digital
code data has been recorded in the form of a dot code which can
optically be read; binarizing means for generating binarized
data, by use of a predetermined threshold value, from an image
signal corresponding to an image of the dot code read by said
10 code reading means; and information reproducing means for
restoring the binarized data generated by said binarizing means
to the multimedia information and for reproducing the multimedia
information, said information recording medium comprising:
data dots which correspond to contents of multimedia
15 information and which can optically be read; and

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

20

a reference dot arranged for use by said binarizing means
when said binarizing means binarizes the image signal and
modifies the predetermined threshold value so that an area of the
reference dot in the image of the dot code read by said code
reading means approaches a predetermined target value, said
reference dot being at least part of a pattern code for use in
determining positions for reading the data dots;

25

wherein said information recording medium has dot interval
measuring dots for measuring a dot interval for correcting at
least one of the area of the reference dot detected by said
binarizing means and the predetermined target value.

5

24. (Amended) An information recording apparatus for
recording multimedia information including at least any one of
audio information, image information and digital code data in the
form of a dot code which can optically be read, comprising:

input means for inputting information relating to said
information recording medium;

storage means for storing [the] a predetermined relationship
between the information relating to [a predetermined] the
information recording medium and one of [the] an area of the dot
10 [when data is recorded] and [the] a recording density when data
is recorded; and

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

15

recording means for reading a corresponding one of the dot area and the recording density from said storage means in accordance with the information that relates to said information recording medium and which has been input by said input means [and relating to said information recording medium so as] to thereby record a dot code corresponding to multimedia information in accordance with the one of the dot area and the recording density.

25. (New) An information reproducing system according to claim 1, wherein

said code reading means successively reads said dot code,
and

5

10

said binarizing means detects, with said reference dot detection means, the reference dot from binarized data generated from a particular image signal corresponding to an image formed from said dot code of a current field or frame, said particular image signal having been binarized based on said predetermined threshold value, and wherein said binarizing means further measures the area of said reference dot to obtain an area measurement, modifies the predetermined threshold value, with said threshold value modifying means, based on said area measurement, to derive said modified threshold value, and

Application No. 09/851,874
Reply to Telephone Interview

Customer No. 01933

15 binarizes the current field or frame based on the modified threshold value.

26. (Canceled)

27. (Canceled)

28. (Canceled)

29. (Canceled)